

## **SECTION 4.10**

### **GASOLINE DISPENSING FACILITIES**

*(Revised March 1992)*

#### **EMISSION INVENTORY SOURCE CATEGORY**

Petroleum Production and Marketing / Gasoline Dispensing Facility

#### **EMISSION INVENTORY CODES (CES CODES) AND DESCRIPTION**

**330-374-1100-0000 (46532)** Gasoline Dispensing Tanks - Working Losses

**330-378-1100-0000 (46540)** Vehicle Refueling - Vapor Displacement

**330-376-1100-0000 (46557)** Gasoline Dispensing Tanks - Breathing Losses

**330-380-1100-0000 (46565)** Vehicle Refueling - Spillage

### **METHODS AND SOURCES**

These categories are used to report the organic gas emissions resulting from the storage and transfer operations at gasoline dispensing facilities. Emissions from storage and transfer operations include the working losses and breathing losses from underground tanks, vapors displaced through vehicle refueling, and spillage. Gasoline dispensing facilities consist of gasoline retail outlets and private dispensing facilities.

Gasoline retail outlets in California include the following four types:<sup>1,2,3</sup>

- (a) Majors - Traditional gasoline stations selling a major brand gasoline, company-owned or franchised (full-service, mini-service, self-service, or a combination).
- (b) Secondaries - Discount gasoline stations providing little service and selling non-branded gasoline, but owned and operated by a major oil company.
- (c) Independents - Gasoline stations independently owned and operated, and not affiliated with a major oil company.
- (d) Non-Gasoline Stations - Retail stores selling gasoline incidental to their business (deriving less than 50 percent of the gross revenues from gasoline sales).

Private gasoline dispensing facilities are also known as bulk (exempt) customers.

The method for estimating emissions is described below using 1990 data.

The California Department of Transportation issues an annual report which contains the throughput of gasoline distributed in the state by county. The total gasoline sales for service stations in the State by County were from the Annual Report from the California State Board of Equalization. The 1990 calendar year report was used for the 1990 gasoline throughput. These gasoline throughputs were estimated using several variables which are strongly correlated with gasoline consumption. The variables included several categories of taxable sales, population, vehicle miles of travel, and the number of registered vehicles. The weighted average share for all the variables was then computed for each county. The above variables were used to divide the total gasoline sales in each county into highway sales and non-highway sales. Highway sales are assumed to be gasoline sales from service stations and non-highway sales are assumed to be gasoline sales from the exempt gasoline dispensing facilities.

Adjustments were made to account for county-specific factors such as business and recreational trips.<sup>4,5</sup> The air basin splits were divided by the ratio of the 1990 population.

Total organic gas emission factors (uncontrolled and controlled) are based on AP-42<sup>6</sup> and ARB's certification testing results<sup>7</sup> and are listed in Table I. The use of controlled factors versus uncontrolled factors is based on information collected by the ARB staff as to which counties have vapor recovery controls in effect for gasoline retail outlets during 1990. For those counties where the controls are in effect for only part of a county, a composite emission factor is calculated. The status of Stage I control (applied to underground tanks) and Stage II control (applied to vehicle refueling) is summarized by county in Table II.<sup>8</sup>

Private gasoline dispensing facilities, which account for about four percent of a given county's throughput each year, are generally exempt from vapor recovery regulations. Since uncontrolled emission factors are up to 20 times as high as controlled factors, these facilities would contribute 15 to 26 percent of the total emissions. Accordingly, for counties where the retail outlets have vapor recovery controls, the emissions were estimated separately from the non-highway emissions and the two emission estimates were combined for the total emissions from each county for each source category.

## ASSUMPTIONS

1. The report, "Travel and Related Factors," by the California Department of Transportation and the report "Taxable Sales in California (Sales & Use Tax) during 1990" are accurate representations of the use of gasoline in California.
2. The effective emission reduction for Stage I and Stage II vapor recovery systems is near the theoretical control efficiency (95 percent in each case) of the equipment.

3. A defect rate for vapor recovery equipment for the vehicle refueling category is assumed to be 5%.

## **TEMPORAL ACTIVITY**

For underground tank working and breathing losses, the annual, weekly, and daily activities are all uniform.

For vehicle refueling and spillage losses, the annual activity is uniform throughout the year. The weekly activity is nearly uniform, with slightly lower activity on the weekend. The daily activity follows a pattern which peaks during the after-work hours in the evening and bottoms between midnight and 6 a.m.

## **COMMENTS AND RECOMMENDATIONS**

It is assumed in this method that the actual emission reduction rates of vapor recovery systems in place are equal to the design control efficiencies except for the vehicle refueling category where the defect rate is assumed to be 5%. This assumption should be validated by evaluation testing of the field effectiveness of the control equipment. Field tests would also provide information on whether the actual efficiencies are uniform or variable across the state. A defect rate for all vapor recovery control equipment is highly recommended.

## **CHANGES IN METHOD AND EMISSION ESTIMATES**

There is a higher activity rate (gasoline throughput) for 1990 than for 1987. Thus, the 1990 statewide emissions are higher than the 1987 emissions. The 1990 method of separating highway and non-highway emissions is more accurate than the 1987 methodology. A defect rate of 5% was included in the vehicle refueling category (CES# 46565). The excess emissions from this defect rate corresponds to the excess emissions from the ARB's Compliance Audit data for this category (CES# 46565). The inclusion of a defect rate and the separation of highway and non-highway emissions in 1990 also resulted in increased emission estimates as compared to 1987.

## **SAMPLE CALCULATIONS**

To estimate TOG emissions from gasoline service stations in Sacramento County, the highway gasoline sales and total sales from the referenced literature are:

<u>Highway Sales (gallons)</u>	<u>Non-Highway Sales (gallons)</u>	<u>Total Sales (gallons)</u>
428,379,041	19,583,193	447,962,234

To estimate the emission factor adjusted for the defect rate of vehicle refueling, the following estimation method is used:

$$\text{Controlled Emission Factor} = 0.5 \text{ lb/1000 gal} \quad \text{Defect Rate} = 5\%$$

$$\text{Uncontrolled Emission Factor} = 10.0 \text{ lb/1000 gal}$$

The adjusted emission factor is:

$$0.5 \text{ lb/1000 gal} + (10 \text{ lb/1000 gal} \times 0.05 \text{ defect rate}) = 1.0 \text{ lb/1000 gal}$$

<u>Category</u>	<u>Highway Emission Factor (lb/1000 gal)</u>	<u>Non-Highway Emission Factor (lb/1000 gal)</u>	<u>Total Emissions (tons/year)</u>
Underground tank - - Working Loss	0.475	9.5	194.76
Vehicle Refueling - Vapor displacement	1.0	10.0	312.11
Underground tank - Breathing loss	0.1	1.0	31.21
Spillage	0.7	0.7	156.79

TABLE I  
EMISSION FACTORS FOR GASOLINE DISPENSING FACILITIES  
(UNIT: lb. TOG/1,000 gallons throughput)

<u>CES</u>	<u>Description</u>	E.F. <u>Without Control</u>	E.F. <u>With Vapor Recovery Control</u>
46532	Underground Tanks - Working Loss	9.5	0.475
46540	Vehicle Refueling - Vapor Displacement	10.0	0.5
46557	Underground Tanks - Breathing Loss	1.0*	0.1*
46565	Vehicle Refueling - Spillage	0.7	0.7

Source: Emission factor for spillage is from AP-42 ; all others are based on ARB certification testing.

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\* The emission factor for breathing loss is 1.0 if no control or only State I control is in effect; the factor is 0.1 if both Stage I and Stage II controls are in effect.

TABLE II

## SUMMARY OF VAPOR RECOVERY CONTROLS IN EFFECT DURING 1990

Air Basin	County	Stage I	Stage II
1. GREAT BASIN VALLEYS A.B.	1. ALPINE 2. INYO 3. MONO	PARTIAL PARTIAL PARTIAL	PARTIAL PARTIAL PARTIAL
2. LAKE COUNTY A.B.	4. LAKE	PARTIAL	PARTIAL
3. LAKE TAHOE A.B.	5. EL DORADO (portion) 6. PLACER (portion)	YES YES	PARTIAL PARTIAL
4. MOUNTAIN COUNTIES A.B.	7. AMADOR 8. CALAVERAS 9. EL DORADO (portion) 10. MARIPOSA 11. NEVADA 12. PLACER (portion) 13. PLUMAS 14. SIERRA 15. TUOLUMNE	PARTIAL PARTIAL YES PARTIAL PARTIAL YES PARTIAL PARTIAL PARTIAL	PARTIAL NO PARTIAL PARTIAL PARTIAL YES PARTIAL PARTIAL PARTIAL
5. NORTH CENTRAL COAST A.B.	16. MONTEREY 17. SAN BENITO 18. SANTA CRUZ	YES YES YES	PARTIAL PARTIAL PARTIAL

TABLE II (continued)  
SUMMARY OF VAPOR RECOVERY CONTROLS IN EFFECT DURING 1990

<u>Air Basin</u>	<u>County</u>	<u>Stage I</u>	<u>Stage II</u>
6. NORTH COAST A.B.	19. DEL NORTE 20. HUMBOLDT 21. MENDOCINO 22. SONOMA (portion) 23. TRINITY	PARTIAL PARTIAL PARTIAL PARTIAL PARTIAL	PARTIAL PARTIAL PARTIAL PARTIAL PARTIAL
7. NORTHEAST PLATEAU A.B.	24. LASSEN 25. MODOC 26. SISKIYOU	PARTIAL PARTIAL PARTIAL	PARTIAL PARTIAL PARTIAL
8. SACRAMENTO VALLEY A.B.	27. BUTTE 28. COLUSA 29. GLENN 30. PLACER 31. SACRAMENTO 32. SHASTA 33. SOLANO (portion) 34. SUTTER 35. TEHAMA 36. YOLO 37. YUBA	PARTIAL PARTIAL PARTIAL YES YES PARTIAL YES YES PARTIAL YES YES	PARTIAL PARTIAL PARTIAL PARTIAL YES PARTIAL YES PARTIAL PARTIAL YES PARTIAL
9. SAN DIEGO	38. SAN DIEGO	YES	YES
10. S.F. BAY AREA A.B.	39. ALAMEDA 40. CONTRA COSTA 41. MARIN 42. NAPA 43. SAN FRANCISCO 44. SAN MATEO	YES YES YES YES YES YES	YES YES YES YES YES YES

TABLE II (continued)  
SUMMARY OF VAPOR RECOVERY CONTROLS IN EFFECT DURING 1990

Air Basin	County	Stage I	Stage II
	45. SANTA CLARA	YES	YES
	46. SOLANO (portion)	YES	YES
	47. SONOMA (portion)	YES	YES
11. SAN JOAQUIN VALLEY A.B.	48. FRESNO	YES	YES
	49. KERN (portion)	YES	YES
	50. KINGS	YES	YES
	51. MADERA	YES	YES
	52. MERCED	YES	YES
	53. SAN JOAQUIN	YES	YES
	54. STANISLAUS	YES	YES
	55. TULARE	YES	YES
12. SOUTH CENTRAL COAST A.B.	56. SAN LUIS OBISPO	YES	YES
	57. SANTA BARBARA	YES	YES
	58. VENTURA	YES	YES
13. SOUTH COAST A.B.	59. LOS ANGELES (portion)	YES	YES
	60. ORANGE	YES	YES
	61. RIVERSIDE (portion)	YES	YES
	62. SAN BERN (portion)	YES	YES
14. SOUTHEAST DESERT A.B.	63. IMPERIAL	YES	PARTIAL
	64. KERN (portion)	YES	YES
	65. LOS ANGELES (portion)	YES	YES
	66. RIVERSIDE (portion)	YES	YES
	67. SAN BERN (portion)	YES	PARTIAL

Source: Reference 8.

Note: All counties designated "PARTIAL" have adopted a Phase I and Phase II vapor recovery rule. The final compliance date for this rule does not take effect in the 1990 emission inventory year.

## **REFERENCES**

1. The Lundberg Letter, Vol. IX, Number 45 (September 10, 1982).
2. The Lundberg Letter, Vol. IX, Number 49 (October 8, 1982).
3. Ms. Trilby Lundberg, Editor, The Lundberg Letter, North Hollywood, CA., Phone(213) 768-5111, peronal communication (January 1983).
4. California State Board of Equalization, Taxable Sales in California (Sales & Use Tax during 1990 Thirtieth Annual Report).
5. California Department of Transportation, Travel and Related Factors in California (1987).
6. U.S. Environmental Protection Agency, Compilation of Air Pollutant Emission Factors (AP-42), Table 4.4-4.
7. Air Resources Board, State of California, Engineering Evaluation Branch, Gasoline Marketing Emission Factors.
8. Air Pollution Control District, Rules & Regulations.

## **UPDATED BY**

Ray Asregadoo  
March 1992

**Table III**  
 1990 Area Source Emissions  
 Activity: Service Stations  
 Process: Tanks  
 Entrainment: Gasoline-Evap  
 Dimn: Working Loss Underground Tanks  
 CES: 46532  
 Process Rate Unit: 1000 Gallons Throughput

AB	County	Process Rate	TOG Emis. (Tons / Year)	CO Emis. (Tons / Year)	NOX Emis. (Tons / Year)	SOX Emis. (Tons / Year)	PM Emis. (Tons / Year)
GBV	ALPINE	3169	1.40	0.00	0.00	0.00	0.00
	INYO	25938	11.30	0.00	0.00	0.00	0.00
	MONO	10566	4.60	0.00	0.00	0.00	0.00
LC	LAKE	13660	5.90	0.00	0.00	0.00	0.00
LT	EL DORADO	15104	6.60	0.00	0.00	0.00	0.00
MC	PLACER	5705	2.50	0.00	0.00	0.00	0.00
	AMADOR	8020	3.50	0.00	0.00	0.00	0.00
	CALAVERAS	9964	4.30	0.00	0.00	0.00	0.00
	EL DORADO	42987	18.70	0.00	0.00	0.00	0.00
	MARIPOSA	4151	1.80	0.00	0.00	0.00	0.00
	NEVADA	41334	18.00	0.00	0.00	0.00	0.00
	PLACER	12814	5.60	0.00	0.00	0.00	0.00
	PLUMAS	7088	3.10	0.00	0.00	0.00	0.00
	SIERRA	1305	0.60	0.00	0.00	0.00	0.00
	TUOLUMNE	20406	8.90	0.00	0.00	0.00	0.00
NC	DEL NORTE	5304	2.30	0.00	0.00	0.00	0.00
	HUMBOLDT	52071	22.60	0.00	0.00	0.00	0.00
	MENDOCINO	42441	18.50	0.00	0.00	0.00	0.00
	SONOMA	26447	11.50	0.00	0.00	0.00	0.00
	TRINITY	3997	1.70	0.00	0.00	0.00	0.00
NCC	MONTEREY	135500	58.90	0.00	0.00	0.00	0.00
	SAN BENITO	9075	4.00	0.00	0.00	0.00	0.00
	SANTA CRUZ	88476	38.50	0.00	0.00	0.00	0.00
NEP	LASSEN	11486	5.00	0.00	0.00	0.00	0.00
	MODOC	8177	3.60	0.00	0.00	0.00	0.00
	SISKIYOU	19401	8.40	0.00	0.00	0.00	0.00
SC	LOS ANGELES	3801486	1652.80	0.00	0.00	0.00	0.00
	ORANGE	1135941	493.90	0.00	0.00	0.00	0.00
	RIVERSIDE	417912	186.70	0.00	0.00	0.00	0.00
	SAN BERNARDINO	595656	259.00	0.00	0.00	0.00	0.00
SCC	SAN LUIS OBISPO	120411	52.40	0.00	0.00	0.00	0.00
	SANTA BARBARA	181983	79.10	0.00	0.00	0.00	0.00
	VENTURA	277510	120.70	0.00	0.00	0.00	0.00
SD	SAN DIEGO	1037814	451.20	0.00	0.00	0.00	0.00
SED	IMPERIAL	41360	18.00	0.00	0.00	0.00	0.00
	KERN	44580	19.40	0.00	0.00	0.00	0.00
	LOS ANGELES	73627	32.00	0.00	0.00	0.00	0.00
	RIVERSIDE	156933	63.40	0.00	0.00	0.00	0.00
	SAN BERNARDINO	140631	61.10	0.00	0.00	0.00	0.00
SF	ALAMEDA	526573	228.90	0.00	0.00	0.00	0.00
	CONTRA COSTA	449125	195.30	0.00	0.00	0.00	0.00
	MARIN	110550	48.10	0.00	0.00	0.00	0.00
	NAPA	40340	17.50	0.00	0.00	0.00	0.00
	SAN FRANCISCO	255722	111.20	0.00	0.00	0.00	0.00
	SAN MATEO	361675	157.30	0.00	0.00	0.00	0.00
	SANTA CLARA	650698	282.90	0.00	0.00	0.00	0.00
	SOLANO	110882	48.20	0.00	0.00	0.00	0.00
	SONOMA	165200	71.80	0.00	0.00	0.00	0.00
SJV	FRESNO	278659	121.20	0.00	0.00	0.00	0.00
	KERN	283217	123.10	0.00	0.00	0.00	0.00
	KINGS	37462	16.30	0.00	0.00	0.00	0.00
	MADERA	30865	13.40	0.00	0.00	0.00	0.00
	MERCED	84646	36.80	0.00	0.00	0.00	0.00
	SAN JOAQUIN	212563	92.40	0.00	0.00	0.00	0.00
	STANISLAUS	160934	70.00	0.00	0.00	0.00	0.00
	TULARE	88538	38.50	0.00	0.00	0.00	0.00
SV	BUTTE	60304	26.20	0.00	0.00	0.00	0.00
	COLUSA	10027	4.40	0.00	0.00	0.00	0.00
	GLENN	14459	6.30	0.00	0.00	0.00	0.00
	PLACER	75011	32.60	0.00	0.00	0.00	0.00
	SACRAMENTO	447962	194.80	0.00	0.00	0.00	0.00
	SHASTA	82895	36.00	0.00	0.00	0.00	0.00
	SOLANO	41428	18.00	0.00	0.00	0.00	0.00
	SUTTER	18083	7.90	0.00	0.00	0.00	0.00
	TEHAMA	25912	11.30	0.00	0.00	0.00	0.00
	YOLO	85018	37.00	0.00	0.00	0.00	0.00
	YUBA	18791	8.20	0.00	0.00	0.00	0.00
<b>TOTAL</b>		<b>13377969</b>	<b>5817.1</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

Fraction of Reactive Organic Gases (FROG): 1.0000  
 (Reactive Organic Gases (ROG) Emissions = TOG X FROG)  
 Fraction of PM10 (FRPM10): .9600  
 (PM10 Emissions = PM X FRPM10)

Table IV  
 1990 Area Source Emissions  
 Activity:Service Stations  
 Process: Vehicle Refueling  
 Entrainment: Gasoline-Evap  
 Dimm: Vapor Displacement  
 CES: 46540

Process Rate Unit: 1000 Gallons Throughput

AB	County	Process Rate	TOG Emis. (Tons / Year)	CO Emis. (Tons / Year)	NOX Emis. (Tons / Year)	SOX Emis. (Tons / Year)	PM Emis. (Tons / Year)
GBV	ALPINE	3169	8.80	0.00	0.00	0.00	0.00
	INYO	25938	72.00	0.00	0.00	0.00	0.00
	MONO	10566	29.30	0.00	0.00	0.00	0.00
LC	LAKE	13660	38.90	0.00	0.00	0.00	0.00
LT	EL DORADO	15104	43.00	0.00	0.00	0.00	0.00
MC	PLACER	5705	16.30	0.00	0.00	0.00	0.00
	AMADOR	8020	22.80	0.00	0.00	0.00	0.00
	CALAVERAS	9964	49.80	0.00	0.00	0.00	0.00
	EL DORADO	42987	122.40	0.00	0.00	0.00	0.00
	MARIPOSA	4151	11.80	0.00	0.00	0.00	0.00
	NEVADA	41334	28.80	0.00	0.00	0.00	0.00
	PLACER	12813	8.90	0.00	0.00	0.00	0.00
	PLUMAS	7087	4.90	0.00	0.00	0.00	0.00
	SIERRA	1305	0.90	0.00	0.00	0.00	0.00
	TUOLUMNE	20406	58.10	0.00	0.00	0.00	0.00
NC	DEL NORTE	5304	15.10	0.00	0.00	0.00	0.00
	HUMBOLDT	52071	148.30	0.00	0.00	0.00	0.00
	MENDOCINO	42441	120.90	0.00	0.00	0.00	0.00
	SONOMA	26447	75.30	0.00	0.00	0.00	0.00
	TRINITY	3997	11.40	0.00	0.00	0.00	0.00
NCC	MONTEREY	135500	385.90	0.00	0.00	0.00	0.00
	SAN BENITO	9075	25.60	0.00	0.00	0.00	0.00
	SANTA CRUZ	88476	252.00	0.00	0.00	0.00	0.00
NEP	LASSEN	11486	32.70	0.00	0.00	0.00	0.00
	MODOC	8177	23.30	0.00	0.00	0.00	0.00
	SISKIYOU	19401	55.30	0.00	0.00	0.00	0.00
SC	LOS ANGELES	3801486	2648.60	0.00	0.00	0.00	0.00
	ORANGE	1135941	791.40	0.00	0.00	0.00	0.00
	RIVERSIDE	417912	296.10	0.00	0.00	0.00	0.00
	SAN BERNARDINO	595656	415.00	0.00	0.00	0.00	0.00
SCC	SAN LUIS OBISPO	120411	83.90	0.00	0.00	0.00	0.00
	SANTA BARBARA	181983	126.80	0.00	0.00	0.00	0.00
	VENTURA	277510	193.40	0.00	0.00	0.00	0.00
SD	SAN DIEGO	1037814	723.10	0.00	0.00	0.00	0.00
SED	IMPERIAL	41360	110.30	0.00	0.00	0.00	0.00
	KERN	44580	127.00	0.00	0.00	0.00	0.00
	LOS ANGELES	73627	51.30	0.00	0.00	0.00	0.00
	RIVERSIDE	156932	104.40	0.00	0.00	0.00	0.00
	SAN BERNARDINO	140630	378.40	0.00	0.00	0.00	0.00
SF	ALAMEDA	526573	366.90	0.00	0.00	0.00	0.00
	CONTRA COSTA	449125	312.90	0.00	0.00	0.00	0.00
	MARIN	110550	77.00	0.00	0.00	0.00	0.00
	NAPA	40340	28.10	0.00	0.00	0.00	0.00
	SAN FRANCISCO	255722	178.20	0.00	0.00	0.00	0.00
	SAN MATEO	361675	252.00	0.00	0.00	0.00	0.00
	SANTA CLARA	650698	453.40	0.00	0.00	0.00	0.00
	SOLANO	110882	77.30	0.00	0.00	0.00	0.00
	SONOMA	165200	115.10	0.00	0.00	0.00	0.00
SJV	FRESNO	278659	194.20	0.00	0.00	0.00	0.00
	KERN	283217	197.30	0.00	0.00	0.00	0.00
	KINGS	37462	26.10	0.00	0.00	0.00	0.00
	MADERA	30865	21.50	0.00	0.00	0.00	0.00
	MERCED	84646	59.00	0.00	0.00	0.00	0.00
	SAN JOAQUIN	212563	148.10	0.00	0.00	0.00	0.00
	STANISLAUS	160934	112.10	0.00	0.00	0.00	0.00
	TULARE	88538	61.70	0.00	0.00	0.00	0.00
SV	BUTTE	60303	42.20	0.00	0.00	0.00	0.00
	COLUSA	10027	28.60	0.00	0.00	0.00	0.00
	GLENN	14459	41.20	0.00	0.00	0.00	0.00
	PLACER	75011	52.30	0.00	0.00	0.00	0.00
	SACRAMENTO	447962	312.10	0.00	0.00	0.00	0.00
	SHASTA	82895	236.10	0.00	0.00	0.00	0.00
	SOLANO	41428	28.90	0.00	0.00	0.00	0.00
	SUTTER	18083	28.40	0.00	0.00	0.00	0.00
	TEHAMA	25912	73.80	0.00	0.00	0.00	0.00
	YOLO	85018	59.20	0.00	0.00	0.00	0.00
	YUBA	18791	29.50	0.00	0.00	0.00	0.00
	<b>TOTAL</b>	<b>13377964</b>	<b>11325.10</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

Fraction of Reactive Organic Gases (FROG): 1.0000  
 (Reactive Organic Gases (ROG) Emissions = TOG X FROG)  
 Fraction of PM10 (FRPM10): .9600  
 (PM10 Emissions = PM X FRPM10)

Table V  
 1990 Area Source Emissions  
 Activity: Service Stations  
 Process: Tanks  
 Entrainment: Gasoline-Evap  
 Dimm: Breathing Loss Underground Tanks  
 CES: 46557  
 Process Rate Unit: 1000 Gallons Throughput

AB	County	Process Rate	TOG Emis. (Tons / Year)	CO Emis. (Tons / Year)	NOX Emis. (Tons / Year)	SOX Emis. (Tons / Year)	PM Emis. (Tons / Year)
GBV	ALPINE	3169	1.50	0.00	0.00	0.00	0.00
	INYO	25938	12.10	0.00	0.00	0.00	0.00
	MONO	10566	4.90	0.00	0.00	0.00	0.00
LC	LAKE	13660	6.80	0.00	0.00	0.00	0.00
LT	EL DORADO	15104	1.10	0.00	0.00	0.00	0.00
MC	PLACER	5705	0.40	0.00	0.00	0.00	0.00
	AMADOR	8020	4.00	0.00	0.00	0.00	0.00
	CALAVERAS	9964	5.00	0.00	0.00	0.00	0.00
	EL DORADO	42987	3.00	0.00	0.00	0.00	0.00
	MARIPOSA	4151	2.10	0.00	0.00	0.00	0.00
	NEVADA	41334	2.90	0.00	0.00	0.00	0.00
	PLACER	12814	0.90	0.00	0.00	0.00	0.00
	PLUMAS	7087	0.50	0.00	0.00	0.00	0.00
	SIERRA	1305	0.10	0.00	0.00	0.00	0.00
	TUOLUMNE	20406	1.40	0.00	0.00	0.00	0.00
NC	DEL NORTE	5304	1.40	0.00	0.00	0.00	0.00
	HUMBOLDT	52071	13.60	0.00	0.00	0.00	0.00
	MENDOCINO	42441	11.10	0.00	0.00	0.00	0.00
	SONOMA	26447	6.90	0.00	0.00	0.00	0.00
	TRINITY	3997	1.00	0.00	0.00	0.00	0.00
NCC	MONTEREY	135500	9.40	0.00	0.00	0.00	0.00
	SAN BENITO	9075	0.60	0.00	0.00	0.00	0.00
	SANTA CRUZ	88476	6.20	0.00	0.00	0.00	0.00
NEP	LASSEN	11486	3.00	0.00	0.00	0.00	0.00
	MODOC	8177	2.10	0.00	0.00	0.00	0.00
	SISKIYOU	19401	5.10	0.00	0.00	0.00	0.00
SC	LOS ANGELES	3801486	264.90	0.00	0.00	0.00	0.00
	ORANGE	1135941	79.10	0.00	0.00	0.00	0.00
	RIVERSIDE	417912	29.60	0.00	0.00	0.00	0.00
	SAN BERNARDINO	595656	41.50	0.00	0.00	0.00	0.00
SCC	SAN LUIS OBISPO	120411	8.40	0.00	0.00	0.00	0.00
	SANTA BARBARA	181983	12.70	0.00	0.00	0.00	0.00
	VENTURA	277510	19.30	0.00	0.00	0.00	0.00
SD	SAN DIEGO	1037814	72.30	0.00	0.00	0.00	0.00
SED	IMPERIAL	41360	2.90	0.00	0.00	0.00	0.00
	KERN	44580	3.10	0.00	0.00	0.00	0.00
	LOS ANGELES	73627	5.10	0.00	0.00	0.00	0.00
	RIVERSIDE	156933	10.40	0.00	0.00	0.00	0.00
	SAN BERNARDINO	140631	9.80	0.00	0.00	0.00	0.00
SF	ALAMEDA	526573	36.70	0.00	0.00	0.00	0.00
	CONTRA COSTA	449125	31.20	0.00	0.00	0.00	0.00
	MARIN	110550	7.70	0.00	0.00	0.00	0.00
	NAPA	40340	2.80	0.00	0.00	0.00	0.00
	SAN FRANCISCO	255722	17.80	0.00	0.00	0.00	0.00
	SAN MATEO	361675	25.20	0.00	0.00	0.00	0.00
	SANTA CLARA	650698	45.30	0.00	0.00	0.00	0.00
	SOLANO	110882	7.70	0.00	0.00	0.00	0.00
	SONOMA	165200	11.50	0.00	0.00	0.00	0.00
SJV	FRESNO	278659	19.40	0.00	0.00	0.00	0.00
	KERN	283217	19.70	0.00	0.00	0.00	0.00
	KINGS	37462	2.60	0.00	0.00	0.00	0.00
	MADERA	30865	2.20	0.00	0.00	0.00	0.00
	MERCED	84646	5.90	0.00	0.00	0.00	0.00
	SAN JOAQUIN	212563	14.80	0.00	0.00	0.00	0.00
	STANISLAUS	160934	11.20	0.00	0.00	0.00	0.00
	TULARE	88538	6.20	0.00	0.00	0.00	0.00
SV	BUTTE	60304	15.70	0.00	0.00	0.00	0.00
	COLUSA	10027	2.60	0.00	0.00	0.00	0.00
	GLENN	14459	3.80	0.00	0.00	0.00	0.00
	PLACER	75011	5.20	0.00	0.00	0.00	0.00
	SACRAMENTO	447962	31.20	0.00	0.00	0.00	0.00
	SHASTA	82895	21.60	0.00	0.00	0.00	0.00
	SOLANO	41428	2.90	0.00	0.00	0.00	0.00
	SUTTER	18083	1.30	0.00	0.00	0.00	0.00
	TEHAMA	25912	6.80	0.00	0.00	0.00	0.00
	YOLO	85018	5.90	0.00	0.00	0.00	0.00
	YUBA	18791	1.30	0.00	0.00	0.00	0.00
<b>TOTAL</b>		<b>13377968</b>	<b>1032.40</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

Fraction of Reactive Organic Gases (FROG): 1.0000  
 (Reactive Organic Gases (ROG) Emissions = TOG X FROG)  
 Fraction of PM10 (FRPM10): .9600  
 (PM10 Emissions = PM X FRPM10)

Table VI  
 1990 Area Source Emissions  
 Activity: Service Stations  
 Process: Vehicle Refueling  
 Entrainment: Gasoline-Evap  
 Dinn: Spillage  
 CES: 46565

Process Rate Unit: 1000 Gallons Throughput

AB	County	Process Rate	TOG Emis. (Tons / Year)	CO Emis. (Tons / Year)	NOX Emis. (Tons / Year)	SOX Emis. (Tons / Year)	PM Emis. (Tons / Year)
GBV	ALPINE	3169	1.10	0.00	0.00	0.00	0.00
	INYO	25938	9.10	0.00	0.00	0.00	0.00
	MONO	10566	3.70	0.00	0.00	0.00	0.00
LC	LAKE	13660	4.80	0.00	0.00	0.00	0.00
LT	EL DORADO	15104	5.30	0.00	0.00	0.00	0.00
MC	PLACER	5705	2.00	0.00	0.00	0.00	0.00
	AMADOR	8202	2.80	0.00	0.00	0.00	0.00
	CALAVERAS	9964	3.50	0.00	0.00	0.00	0.00
	EL DORADO	42987	15.10	0.00	0.00	0.00	0.00
	MARIPOSA	4151	1.50	0.00	0.00	0.00	0.00
	NEVADA	41334	14.50	0.00	0.00	0.00	0.00
	PLACER	12814	4.50	0.00	0.00	0.00	0.00
	PLUMAS	7087	2.50	0.00	0.00	0.00	0.00
	SIERRA	1305	0.50	0.00	0.00	0.00	0.00
	TUOLUMNE	20406	7.10	0.00	0.00	0.00	0.00
NC	DEL NORTE	5304	1.90	0.00	0.00	0.00	0.00
	HUMBOLDT	52071	18.20	0.00	0.00	0.00	0.00
	MENDOCINO	42441	14.90	0.00	0.00	0.00	0.00
	SONOMA	26447	9.30	0.00	0.00	0.00	0.00
	TRINITY	3997	1.40	0.00	0.00	0.00	0.00
NCC	MONTEREY	135500	47.40	0.00	0.00	0.00	0.00
	SAN BENITO	9075	3.20	0.00	0.00	0.00	0.00
	SANTA CRUZ	88476	31.00	0.00	0.00	0.00	0.00
NEP	LASSEN	11486	4.00	0.00	0.00	0.00	0.00
	MODOC	8177	2.90	0.00	0.00	0.00	0.00
	SISKIYOU	19401	6.80	0.00	0.00	0.00	0.00
SC	LOS ANGELES	3801486	1330.50	0.00	0.00	0.00	0.00
	ORANGE	1135941	397.60	0.00	0.00	0.00	0.00
	RIVERSIDE	417912	146.30	0.00	0.00	0.00	0.00
	SAN BERNARDINO	595656	208.50	0.00	0.00	0.00	0.00
SCC	SAN LUIS OBISPO	120411	42.10	0.00	0.00	0.00	0.00
	SANTA BARBARA	181983	63.70	0.00	0.00	0.00	0.00
SD	VENTURA	277510	97.10	0.00	0.00	0.00	0.00
	SAN DIEGO	1037814	363.20	0.00	0.00	0.00	0.00
	IMPERIAL	41360	14.50	0.00	0.00	0.00	0.00
SED	KERN	44580	15.60	0.00	0.00	0.00	0.00
	LOS ANGELES	73627	25.80	0.00	0.00	0.00	0.00
	RIVERSIDE	156932	54.90	0.00	0.00	0.00	0.00
	SAN BERNARDINO	140631	49.20	0.00	0.00	0.00	0.00
	ALAMEDA	526573	184.30	0.00	0.00	0.00	0.00
	CONTRA COSTA	449125	157.20	0.00	0.00	0.00	0.00
	MARIN	110550	38.70	0.00	0.00	0.00	0.00
	NAPA	40340	14.10	0.00	0.00	0.00	0.00
	SAN FRANCISCO	255722	89.50	0.00	0.00	0.00	0.00
	SAN MATEO	361675	126.60	0.00	0.00	0.00	0.00
SF	SANTA CLARA	650698	227.70	0.00	0.00	0.00	0.00
	SOLANO	110882	38.80	0.00	0.00	0.00	0.00
	SONOMA	165200	57.80	0.00	0.00	0.00	0.00
	FRESNO	278659	97.50	0.00	0.00	0.00	0.00
	KERN	283217	99.10	0.00	0.00	0.00	0.00
	KINGS	37462	13.10	0.00	0.00	0.00	0.00
	MADERA	30865	10.80	0.00	0.00	0.00	0.00
	MERCED	84646	29.60	0.00	0.00	0.00	0.00
	SAN JOAQUIN	212563	74.40	0.00	0.00	0.00	0.00
	STANISLAUS	160934	56.30	0.00	0.00	0.00	0.00
SV	TULARE	88538	31.00	0.00	0.00	0.00	0.00
	BUTTE	60304	21.10	0.00	0.00	0.00	0.00
	COLUSA	10027	3.50	0.00	0.00	0.00	0.00
	GLENN	14459	5.10	0.00	0.00	0.00	0.00
	PLACER	75011	26.30	0.00	0.00	0.00	0.00
	SACRAMENTO	447962	156.80	0.00	0.00	0.00	0.00
	SHASTA	82895	29.00	0.00	0.00	0.00	0.00
	SOLANO	41428	14.50	0.00	0.00	0.00	0.00
	SUTTER	18083	6.30	0.00	0.00	0.00	0.00
	TEHAMA	25912	9.10	0.00	0.00	0.00	0.00
TOTAL	YOLO	85018	29.80	0.00	0.00	0.00	0.00
	YUBA	18791	6.60	0.00	0.00	0.00	0.00

Fraction of Reactive Organic Gases (FROG): 1.0000  
 (Reactive Organic Gases (ROG) Emissions = TOG X FROG)

Fraction of PM10 (FRPM10): .9600  
 (PM10 Emissions = PM X FRPM10)